

Stereo 3-D video on the Grid?

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The Internet2 yearly meeting in Atlanta in October 2000 included a demonstration of 3-D video streaming over Internet2: [Network-Based Real-Time Full-Motion Stereo Imaging for Teaching and Research](#). The demo came out of [John MacKenzie's Microbiology lab](#) at North Carolina State University.

Here's how it worked:

1. dual cameras arranged with their lense openings approximately 6cm apart fed video capture hardware and software that created....
2. separate video streams carrying the data from each camera across the network to...
3. another system whose video software decoded the video streams and sent them to...
4. separate projectors which projected each video stream through polarizing filters onto the...
5. SAME movie screen (to create a single overlayed, but slightly offset, image) where it was observed through...
6. polarized paper glasses.

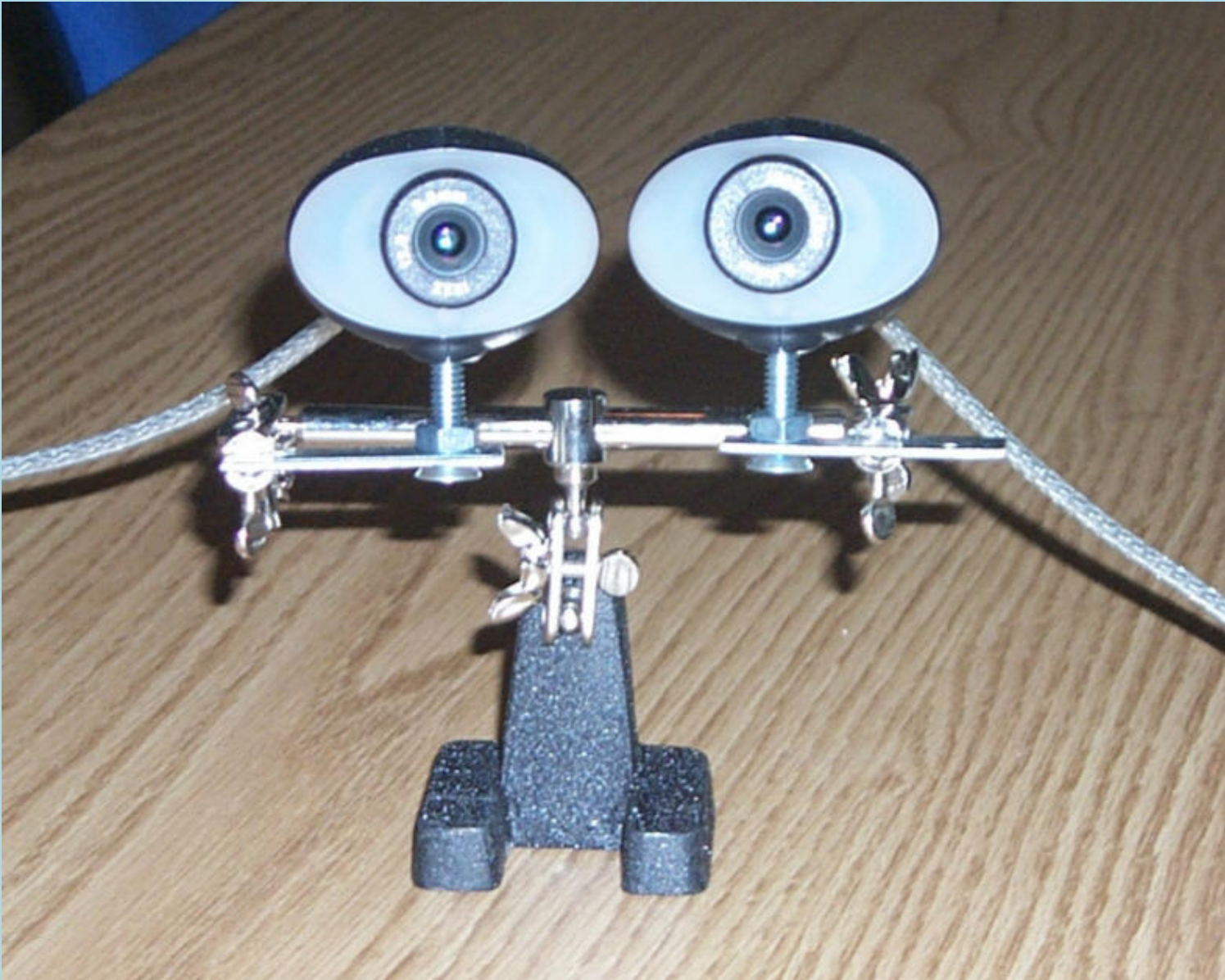
Note that the two projectors were arranged one above the other on separate levels of a specially constructed stand that allowed for fine adjustments in each dimension. Here is a similar projector stand:



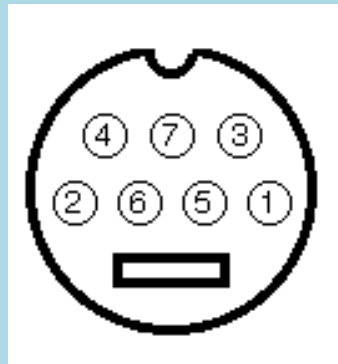
Chief twin projector stand: (503-649-6055)

We have put together a version of this approach to run over the usual AG infrastructure using:

- dual iREZ CritterSV cameras (available for about \$150 [online](#), which produce S-video signals (hence the "SV") to be fed to our Access Grid [Hauppauge WinTV](#) Model 401 video capture cards.



Note that the cable to the CritterCamSV is a mini-DIN-7:



whereas the "usual S-video cable connector" is a mini-DIN-4. Since the CritterCamSV cable is only about 4 feet long it is usually necessary to use an extension cord with each camera. mini-DIN-7 extension cords are extremely difficult to come by, but [Black Box](#) is able to construct such cords on a custom contract basis.

- sheets of linearly polarized plastic discs from Edmund's Scientifics (at approximately \$22.50 per pair), and
- plain white linearly polarized 3-D paper glasses from [American Paper Optics](#) (at approximately \$27.50 for 50 pair--minimum order), and
- a 70x70" [Da-lite Picture King](#) (at approximately \$300 from [Presenting Solutions](#)), constructed from "Super Wonderlite silver lenticular material". Some screen materials will NOT maintain polarization of 3-D images. Matte white, beaded white, etc. will depolarize the projected image, and will show a double image instead of a 3-D image. Silver surfaced or aluminized screens are commonly used to preserve polarization.

Related links

[Pixera](#)

Another vendor of small cameras.

[Stereoscopy.com](#)

Claims to be " your one stop information source about the fascinating world of 3D."

[Reel 3D](#)

Claims to be the "Worlds Largest Mail Order Selection of New 3-D Supplies," and has several options for glasses (including paper, plastic framed, clip-ons, and flip-up clip-ons).

[What is polarized light?](#)

A short description of polarization. Linear polarization is usually used at 45 and 135 degrees, which has apparently been a standard since the early 1940's.

[Various issues](#)

A list of discussion list contributions on various 3D issues (such as screens, 3D electron microscopy, etc.) compiled by the Electron Microscope Core Lab at the U. of Florida.

[The Solar System in 3D](#)

3-D images of geological formations throughout the solar system from the Lunar and Planetary Institute

[3-D Displays: A review of current technologies](#) by the Heinrich Herz Institute

Excerpt: Optimum results have been reported for aluminized surfaces and for translucent opalised acrylic screens.

[New generation of desktop computer interfaces](#) published by the Heinrich Herz Institute

Are you ready for your 3-D desktop?

[Stereophotography: An introduction to stereo photo technology and practical suggestions for stereo photography](#)

Pretty much covers the gamut

[Da-lite mirror stand](#)

For back-projection in a cramped environment, you may want to use a mirror to increase your throw distance, as is done with this mirror stand:



Using mirrors

Silver mirrors are ok, but at angles of incidence close to 45 degrees aluminum mirrors will eliminate polarization except under ideal conditions.

The 3-D Internet--Will it take off?

The way of the future? The mainstream browser? They say so in 96.

Must see 3-D engines

Driving this equipment with software rather than video streams.

Questions

- how to point and focus cameras for 3-D video,
- how to point and focus the projectors (image size, image register, keystone effects, etc.),
- how to build or buy suitable projector stands, screens, filters, etc.,
- how to arrange the polarizing filters,
- whether (or how well) we can expect this to work with the commodity products, AG software, and network connectivity we have,
- how to record such streams...can Voyager be used?
- how does 3-D affect the video conference experience (sense of presence, level of intimacy, etc.)

There is an online version of this presentation located at:

<http://www.cc.ukans.edu/~grobe/3D-for-ANL.html>.

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